ARCHIVES 14 MAY 82 00
F81-049/28) U45.100

the CANNON

February 3, 1982 | University of Toronto Engineering Society | Vol. IV No. 6

Eng Accreditation Threatened

Professor Ursula Franklin of Metallurgy and Materials Science engineering was recently accepted intn the Order of Canada. Watch for a feature article in next month's *CANNON*.

by Vince Volpe
Professional Dev. Chariman

There is a very important problem facing engineers and engineering students in Canada, and particularly those in Quebec. This problem threatens to drastically change the education of engineers in Quebec, and the respect which the Canadian engineering community enjoys worldwide. The problem is the declaration by Order in Council 1755-81 of the National Assembly in Quebec that graduates from the Ecole de Technologie Superior (ETS) be granted professional status as engineers.

The ETS opened its doors in 1974. It was originally supposed to train students to assume responsibilities between those of the technician and those of the engineer. The two year programs of ETS consists of sixty theoretical and twelve work term credits. This is fully one half the theoretical requirement of all engineering schools in the province.

In 1977 the board of governors of ETS demanded that graduates of this school be accepted by the licencing body for professional engineers in Quebec, the Order of Engineers of Quebec (OIQ). To investigate these demands, three committees were formed drawing members from academic and professional engineering communities in Quebec. All three committees agreed that ETS graduates do not qualify for admission. A referendum was held of all members of the OIQ, which is similar in nature to the APEO in Ontario. Over 98% of the membership rejected the idea of universal admission for ETS graduates. The board of governors of ETS rejected any further discussion at that time, until universal admission into the Order was granted.

On June 23, 1981, the government of Quebec announced Order in Council 1755-81, despite the best interests of the engineering profession and by association, the safety of the citizens of Quebec. The OIQ has since then tried to negotiate a solution to the problem. Their proposal was to create a mixed order of engineers and ETS graduates. The ETS has turned down this proposal.

The OIQ is presently involved in a court battle over the matter. Apparently, five ETS graduates entered the offices of the OIQ, and demanded admission without having to write the exam required for applicants who do not attend an accredited engineering school. After the OIQ refused the demands of these grads, the students took the OIQ to court. At present, graduates from ETS that attempt the Master of Engineering program at accredited engineering schools receive consideration for the completion of only the first year of the accredited undergraduate program.

The consequences of this legislation is obvious for the engineering profession in Quebec. The graduates of ETS are obviously not able to meet the requirements that graduates of other engineering programs must meet. These requirements are set by the OIQ, upon recommendations from the Canadian Accreditation Board (CAB). The respectability of the profession in Quebec is at risk due to its dilution with ETS graduates. The safety of citizens and the environment is thus at stake—these are responsibilities of an engineer.

As a result of this legislation, other provincial licencing association will most likely demand that Quebec engineers pass a technical exam before granting professional status. At present, they are requested to write only a legal exam. It is conceivable that engineers from the rest of Canada will have to pass a similar exam, before being able to acquire professional status in Quebec. There is no reason why any accredited university graduate in engineering should have even to write this technical exam.

This result affects engineers across Canada. More important than this, however, is the restriction on the mobility of professional engineers across the U.S. border. The CAB has an understanding with a similar association in the U.S. that all professional engineers in each country may acquire professional status across the border by passing the appropriate legal exam. The proposed dilution of the engineering profession in Canada with ETS graduates will place this mobility at risk.

One very important final concern is the precedent the ETS issue presents to similar technical schools in Ontario, Alberta, and British Columbia. It is very possible that this professionaly undesirable type of legislation may be promoted in these provinces.

Fees Committee Drafts Agreement

by Andrew Kilpatrick
Ind Eng 8T2

Engineering students will be voting in a referendum on March 4 and 5 to decide on a proposed $100.00 temporary incidental fee.

At the Engineering Society Council meeting on Tuesday, January 26, Council voted to approve the fee as defined by the Special Proposed Incidental Fee (SPIF) Committee. Council had previously approved the fee in principle, and set up the SPIF Committee to investigate the possibilities of the fee.

The SPIF Committee, chaired by fourth-year student Michael Nettleton, presented a nine-part agreement to the Council. Higblights of the agreement include the following:

- The amount of the fee is fixed at $100 per year.
- The fee will last for a maximum of three years.
- A student-faculty committee will review the fee each spring term and present its findings to Council.
- Council will review the fee after a presentation by the student-faculty committee.
- Council will have the power to terminate the fee.
- The fund generated by the fee will be used for supplies, equipment, and teaching assistants in full-time courses taught in Engineering.

After approving the fee, Council decided to hold a referendum for students to decide whether or not they approve the fee. The referendum will be held with the Engineering Society Elections in March.

Council also voted to extend the terms of reference of the SPIF Committee to supervise the information campaign preceding the referendum. Although Council has committed itself to support the referendum, Mr. Nettleton has made it clear that any group wishing to oppose the temporary incidental fee will be given equal opportunity to express its views.

The next meeting of the SPIF Committee will be Wednesday, February 3 at 5 p.m. in the Engineering Stores. The SPIF Committee invites all interested students to attend.

This Month

SPIF Proposes Agreement
The Special Proposed Incidental Fee Committee has drafted a proposed agreement between the engineering undergraduate students and the Faculty. It is presented with a discussion of its provisions. . . . . page 3

CCES Ends Successfully
U of T sent four delegates to the 14th annual Canadian Congress of Engineering Students held at Waterloo. Their report is included. . . . . page 6

UTR and Engineering
University of Toronto Radio (UTR) is trying to establish itself financially through an incidental fee to students. The UTR Station Manager discusses a university radio station and its implications. . . . . page 7

Engineering Forum: Engineers and Society
This month Milan Nastich, President of Ontario Hydro, addressed U of T undergraduate engineers. His remarks are reproduced. . . . . page 5,6

the CANNON

Editorial Offices
3rd Floor, Old Metro Library
20 St. George Street
University of Toronto
Toronto, Ontario
M5S 2E4 978-5377

Editor John Samochin

Staff Photographer
Ofer Pittel

Contributors
Mike Nettleton
Randy Sinukoff
John Voss

ISSN 0711-4370

THE CANNON is a publication of the University of Toronto Engineering Society. It is published monthly to announce Eng. Soc. events, discuss Faculty and University matters, and present technical information of interest to Engineering undergraduates. Subscriptions are available, call Ella at 978-2917. Anyone interested in helping with THE CANNON is most welcome.

THE CANNON encourages submissions; please type or write legibly. Deadline for articles is one week before publication date, notices and letters by 5:00 p.m. the Friday prior to publication. Comments on THE CANNON or articles appearing in it are appreciated. The editors reserve the right to edit letters for brevity.

Letters

Dear Editor:

It is with caution but genuine concern that I express my feelings today. Having enjoyed the many events sponsored by the various committees over the past 3½ years, I feel quite happy with the operations of the Engineering Society and its affiliates.

The one organization which has been a great disappointment though is the Engineering Athletic Association. The EAA has such a great potential to encourage the participation of the masses but yet it has seemingly catered to the few who posses ample athletic ability. Sure, participation on inter-faculty teams are promoted, but what about the common JOE who may not be quite good enough to make the inter-fac teams? What does he get for the 6 dollars he must give to the EAA? Some will answer this with the S-Dance, which is open to all, but how many people will go to an awards banquet without having participated in something first? Last year's S-Dance was attended by some 100 people; one third was the Mulock Cup football team who promptly left after receiving their steins.

Where have the traditional Engineering tournaments gone? The volleyball, hockey, touch football tournaments in which winning is not the most important thing but playing a sport with your classmates against other disciplines is. There has been no evidence of that so far this year. Why?

Beyond this, disparity even exists among the inter-fac teams. I can only relate my personal experience from playing on the volleyball and soccer teams. This year, as well as last, there are five men's volleyball teams. Yet there are only 4 volleyballs available from the EAA. My calculator tells me that's less than one ball per team.

Also, this year, the Junior soccer team had 22 players, yet we were given one new ball making a total of two. The women's team on the other hand had at least four. I'm not saying the women do not deserve them, but I feel strongly that the men's team could have received equal treatment.

I have no idea what the executive members of the EAA feel with regard to these comments (some of which may be off base for which I stand corrected) but let's hear from them. Let them show the average engineer who would enjoy playing in a tournament on a Saturday that indeed the EAA is interested in us. Let them step forward and pay some attention now to the not so athletically gifted, for we as members of this faculty deserve it.

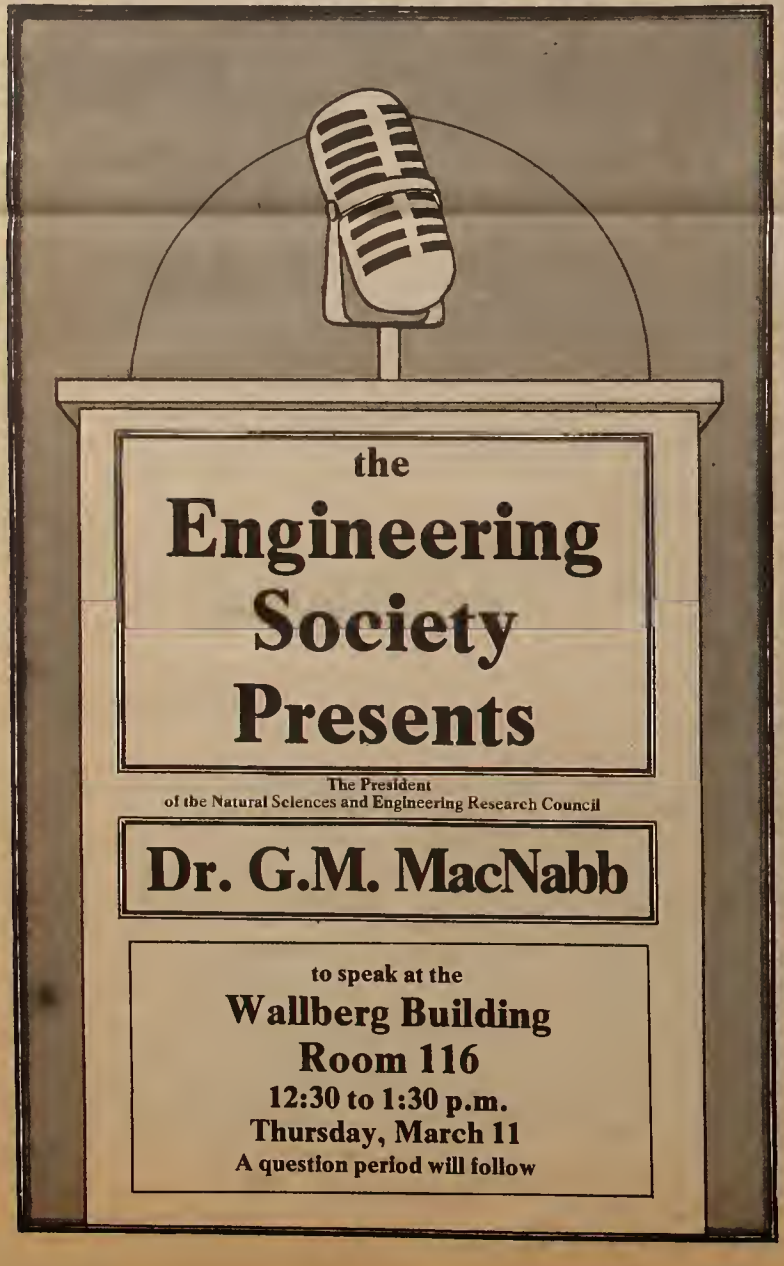
Yours sincerely,
D. Chow
Chem 8T2
Sports Director,
Chem Eng Club

Re: *The Varsity* and Objectivity

Dear Sirs:

I would like to comment on Wayne Levin's article in the January 12, 1982 issue of *the CANNON*. In my opinion the article was very well written; however, I must correct Mr. Levin on one point. He states that *The Varsity* has an "editorial board" which consists of thirteen members. I believe that Mr. Levin was making reference to the Board of Directors. I am a member of the board and, unfortunately, the board is only responsible for the business and legal decisions of Varsity Publications. Wayne Levin has presented valid criticisms of *The Varsity*. I will do my best to ensure that those responsible for editorial content at *The Varsity* will get the message.

Sincerely,
Michael Freedman
Civil 8T2
Board of Directors,
Varsity Publications



Toike Troubles

by John Samochin
Eng Sci 8T3

"When is the next issue of the *Toike* coming out?" is a question that I am often asked these days. I only wish I had a good answer. My involvement with the *Toike Oike* was limited to layout and typesetting of the last issue, *The Glob and Male* parody. Due to my presence and work on the *Toike*, I was given the title of Assistant Editor. After several weekends and two 'all-nighters' in a row, *The Glob* went to press and disappeared phenomenally when distributed. The feeling among the three editors (myself included) was that although we sacrificed ourselves (both in the time and mark sense), the result would be worth it. Hopefully, the high standards of both content and presentation set in *The Glob* would be followed by those doing the *Toike* in the spring term. What happened was completely predictable.

The makeup on January 6 was a qualified failure. Sure, lots of people were out but very little real writing was done. Submissions of material produced at home (where most of the good writing is done) were pitifully low in number. But worse than this, the quality of material submitted was, for the most part, deplorable. Why? Do U of T students think the *Toike* is a journalistic garbage bin where everything is classified under "humour" because it doesn't fit anywhere else? Personally, I refuse to work on a Toike of substandard quality. There is no reason for a return to hastily slapped together gross-out *Toikes*; *The Glob* was well received by almost everyone and *Toikes* of the future should be done along these lines.

What lines? Well, *The Glob* managed to stay on the tightrope between falling into complete sexual crudity and totally dull witticisms. Sexual humour (not sexist humour) was and will always be a part of the *Toike*, but if nothing else, *The Glob* proved that grossness is not vital for comedy. The gross-out jokes and articles are "cheap" laughs because they are incredible easy to write, requiring no insight, reflection or conscious thought. Good satire demands these three aspects and is much more difficult to produce.

When is the *Toike* coming out? Probably when it gets a staff together and gets submissions worthy of publication. The January issue was originally intended to be a satire on *Macleans* magazine, but no material was generated to satire that specific periodical. Thus there are no concrete plans for scheduling a *Toike* pulication date. Is anyone still interested in the *Toike*? Wanting to read it is not enough. If you would like to help in some capacity, no matter how small, come to the Engineering Stores and leave a note in the *Toike* mailbox with your name and phone number. Or even better, attend the Communications Committee (EngCom) Layout Seminar on Thursday, February 11 to learn how a newspaper is put together and how you can help.

If something isn't done for the *Toike* now, it will die or even worse, keep publishing in a way that it would be better off dead.

University of Toronto Engineering Society Temporary Incidental Fee

Proposed Agreement

as amended and apprnved by the Engineering Snciety Cnuncil, Tuesday, January 26, 1982

Preamble:
On behalf of all full-time students registered in the Faculty of Applied Science and Engineering, The University of Toronto Engineering Society proposes that a temporary incidental fee be levied upon all full-time undergraduate students registered in the Faculty of Applied Science and Engineering, subject to the following ten provisions:

Provision 1:
The amount of the temporary incidental fee shall be $100 per year.

Provision 2:
a) The term of the temporary incidental fee shall be a maximum of three years, subject to the provisions of revocation as specified in provision (7b).
b) The three possible years of the term shall be the school years 1982-83, 1983-84, and 1984-85.

Provision 3:
The temporary incidental fee shall be reviewed, as specified in provisions (4), (5), (6), and (7), in each Spring Term by the Engineering Society Council.

Provision 4:
The procedure for review of the temporary incidental fee shall consist of:
a) Student-faculty discussion of the use of the temporary incidental fee in the committee as defined in provisions (5) and (6).
b) A presentation to the Engineering Society Council by the Committee defined in provisions (5) and (6).
c) A review vote by the Engineering Society Council to re-approve the fee. The review vote is a vote to reconsider and shall require a two-thirds majority vote to be defeated.

Provision 5:
The Special Committee of the Engineering Society Council to review the temporary incidental fee shall consist of:
a) The Dean of the Faculty of Applied Science and Engineering,
b) The eight Department and Division Chairmen of the Faculty of Applied Science and Engineering,
c) Eight members of the Engineering Society Council, representing the eight Departments and Divisions of the Faculty of Applied Science and Engineering,
d) The First Year Chairman of the Engineering Society Council,
e) A student appointed by the Engineering Society Council to chair the Special Committee.

Provision 6:
The Special Committee of provision (5) shall meet before the review vote of the Engineering Society Council, and the student members of the Special Committee shall report back any and all concerns of the Engineering Society Council to a meeting of the Special Committee held after the review vote of the Engineering Society Council.

Provision 7:
The temporary incidental fee shall cease to exist either:
a) After the three years specified in provision (2), or
b) In the years following failure of the review vote by the Engineering Society Council as specified in provision (4c).

Provision 8:
The temporary incidental fee shall be used for supplies, equipment, and teaching assistants in courses taught by the Faculty of Applied Science and Engineering for its full-time undergraduate students.

Provision 9:
The temporary incidental fee shall be collected by the University of Toronto with all regular fees, as long as the temporary incidenatl fee shall exist, and shall be passed directly to the Faculty of Applied Science and Engineering.

Provision 10:
The nature and implementation of this agreement is absolutely contingent upon all of the preceding provisions.

Fees Agreement Explained

by Michael Nettleton
Chairman, SPIF Committee

The Proposed Agreement concerning the temporary incidental fee is the result of the first few meetings of the Special Proposed Incidental Fee (SPIF) Committee. We arrived at each point by general concensus and tried to cover all potential aspects of the fee.

The best method of explaining the Proposed Agreement is to progress through it, provision by provision. Note that the preamble refers to "full-time undergraduate" Engineering students; this is because the Engineering Society has no jurisdiction over any other students.

•Prnvision [1]. The amount of the incidental fee was originally proposed by Dean Slemon. $100 per student is approximately twenty percent of the shortfall in the area of teaching assistants, supplies, and equipment. The Committee felt that $100 was a significant yet affordable amount. Because the fee is intended to be a demonstrative action to Alumni and other benefactors of the Faculty, it is important for the amount to be significant. On the other hand, it is important that the amount be within the ability of Engineering students to pay.

•Provisinn [2]. The Committee first considered two forms of the fee. The first was a one-year fee which could be renewed each year. The second was a multi-year fee which could be terminated each year. A compromise between these resulted in a multi-year fee which would be reviewed eacy year, and terminated, if necessary. The Committee felt that a three year term would be optimal , since students in the Faculty would still be in the Faculty three years from now.

•Prnvisinn [3]. The Spring Term is an appropriate time for review as the review will occur under an experienced Council, and a review in the Fall would have no effect until the following year anyway.

•Provisinn [4]. The Committee felt that discussion of the use of the fee with students and faculty members would be appropriate, before a decision is made. It would be unwieldy to have such a discussion in Council, and so the committee format was adopted. This committee would summarize the discussion for Council. Council would then vote on the matter.

•Provisinn [5]. The Dean and Division/Department Chairmen would be directly involved in the distribution of the fee within the Faculty, and would thus be most qualified in answering questions regarding the use of the fee. The Dean could also report on the progress of major fund-raising ventures as feedback for the success of the fee. Members of Council from the eight Departments and Divisions would represent a complete cross-section of the student views of the fee, and the First Year Chairman was included to provide continuity for the first year class. Duties of the Special Committee Chairman would be to organize and conduct meeting, and to present a report to Council.

•Prnvisinn [6]. Although there are proper channels for this to occur, the incidental fee discussion has already attracted comments regarding useless tutorials, extraneous teaching assistants, poor textbooks, and inadequate tutorials. Because the incidental fee is related to teaching assistants and supplies, and because discussion of the incidental fee acts as a focus for other related problems, it was felt that it would benefit the Faculty if the student members of the Special Committee were to report such related concerns back to the faculty members of the Special Committee.

•Prnvisinn [7]. It was suggested in the SPIF Committee that confirmation of the Council review vote by a referendum would ensure resposible action, but the Committee felt that this procedure was unnecessary. Council can be depended upon to act resposibly, and in such a major decision as the repeal of the fee, Council would likely hold a referendum if possible.

•Prnvisinn [8]. This simply clarifies the intent of the fee and its applicability to full-time undergraduates.

•Prnvisinn [9]. The Committee considered having the fee passed to the Engineering Society first, but this was considered absolutely unnecessary.

•Provisinn [10]. Council and the Committee wanted to ensure that it would be possible to have the fee self-terminating in three years, and that it would be possible to terminate the fee before then in necessary. This clause merely indicates that no incidental fee will be created if such termination is not possible.

Eng Soc Notice

Nominations are now open for elected positions on the Engineering Society for the 1982-83 term. The positions of President, Vice President:Administration, Vice President:Activities, Treasurer, and Secretary are to be contested. Election rules, nomination forms, and further instructions are available from Ella in the Engineering Offices, 3rd floor, Old Metro Library.

Engineering Forum:

The follwing is a transcript of a speech given hy Milan Nastich of Ontarin Hydrn in conjunction with the U nf T Engineering Society's Professinnal Develnpment Committee and its prngram of inviting speakers frnm industry, Government and Academia tn speak ahnut the Engineer in Today's Society.

I want to begin by thanking the organizers for inviting me here. Speaking at a University is always a special pleasure. In the first place, it's an honour, and in the second, it gives me a chance to get out of the overheated world of megaprojects, corporate pressures, and public expectations. It gives me a chance to escape into a place where intellectual objectivity, enthusiasm, and high ideals—I'm told—are still a fact of life!

On my way over here I noticed a Toronto Zoo van with the slogan, "It's a jungle out here." I immediately thought that I could with complete truth say the same thing today about the engineering world you're going to be working in.

While you're thinking about that, let me stress that I didn't come here as a corporate guru to offer great pearls of wisdom. Regard me, if you will, as a battlescarred veteran fresh from the front, bringing you a progress report on the kind of work climate you will face before long.

What is the climate for engineering these days? There's some good news—lots of jobs—but these jobs will be difficult and more demanding than you might expect. There are two important elements that I would like to address today. One is the changing role of the engineer in society. The other is the changing public perception of engineers.

On the one hand, things have heated up noticeably for engineers over the last few years because engineers now more than ever have to respond to environmental pressures and wider social concerns. On the other hand, things have cooled considerably because the public's enthusiasm for engineers and technologists is no longer what it once was.

These two changes are related, and I'd like to draw on my own experience and perceptions to show how they have evolved, and what their implications are for young engineers.

Speaking from an engineering organization, let me assure you that engineering is no longer just a technical discipline. To be sure, you will be designing and modifying and building equipment and systems. But in doing so, you'll have to keep one eye on your technical objectives, one eye on the economics of the design, and one eye on the possible environmental and social impact.

It's not easy, I assure you, but it's a fact of life that public concerns, even more that technical factors, are coming to dominate the life of the engineer these days.

Since I believe one example is worth a ton of generalization, I'll give you an example taken from my own experience.

I'm certain you're all familiar with the term "acid rain", but for those of you who have failed your Chemistry prerequisite, let me give you a brief description.

When any kind of fossil fuel like coal is burned, nitrogen oxide and sulphur dioxide are created as byproducts. They mix with water vapour in the air, then fall to the earth in the form of acidic rain, mist, or snow, threatening the quality of our lakes and rivers.

by the late 1970's, the people of the province were becoming increasingly concerned about acid rain, and the government was looking into legislation aimed at reducing the amount of acid gas emissions originating in Ontario.

Some people suggested that Ontario Hydro use the latest in pollution-control technology to reduce sulphur dioxide emissions. It was suggested that we equip all of our coal-burning plants with flue-gas scrubbers, devices which can remore up to 90% of the sulphur dioxide from coal burning emissions.

Hydro estimates that the total cost over ten years of installing scrubbers on two units is rougbly half a billion dollars. Putting them in all our coal plants would cost well over two billion dollars.

Is it worth the money? Studies indicate that Hydro's coal-fired generating stations are contributing less than 6% of the acid rain falling on sensitive areas of the province. Should we spend a couple of billion dollars on a pollution-control program that would reduce acid gas concentrations over our skies by barely measurable amounts?

It's an important question, and it's one in which engineers play a big role. They have to estimate how much programs will cost, and how effective they will be so that the public can make an informed decision as to whether the scrubbers are worth the money or are the best alternative. And once the overall objectives have been set, engineers have tbe responsibilities of implementing these social decisions as effectively and economically as possible.

Milan Nastich, President of Ontario Hydro delivered a well received speech to future engineers. Depicted are, left to right, Brett Calder, Chairman OEDC Committee, Milan Nastich, Lawrence Kwan and Alhert Li, winners of the OEDC's Corporate Design class for the last two years.

That's exactly wbere Ontario Hydro stands on the acid rain program. The Ontario Government has asked Hydro to reduce sulpbur dioxide and nitric oxide emissions to 300,000 tons by 1990. Tbat's about half of what we produce at present.

It's not difficult to see why we are being asked to cut back emissions. The reduction in itself won't improve the environment very much, but if every coal-burning utility in Canada and the U.S. were to do the same, things would be different. Someone bas to begin somewhere, and it makes sense for Hydro to "clean up its own act," so to speak. We could hardly ask another acid rain producter to cut its emissions if we didn't do tbe same.

"Engineers have made contributions which no one can dispute..it's hard to see why people should he down on engineers. So what's the problem?"

The social expectations are clear. Cut acid gas emissions by balf. But tbe engineering solutions are not. Wbat could be done to reduce our emissions, wbat would it cost, and bow effective would it be? Getting answers demands more tban technical engineering skills. It demands judgment and sensibility because there are a number of issues to weigb.

Our analysis concluded tbat scrubbers are not the solution, althougb they are part of the solution. We do plan to use scrubbers on two of our units, and cost over 10 years will be about $500 million. But installing more than two scrubbers would not be cost-effective because there are other measures open to us.

We can use more nuclear power instead of coal. By the late 80's we'll have more nuclear power plants in operation. We can also develop some small-scale hydro-electric power to help us meet peak power demands. We could also import more power from Quebec and Manitoba. And when we do have to use coal, we can use more prewashed and low-sulpbur coal which cuts emissions at tbe source.

These measures will nicely complement the use of a couple of scrubbers in cutting acid gas emissions by 50% in the next ten years despite increasing our power production by 40%.

Tbis multi-faceted approach includes a number of non-technical "fixes" to wbat might appear on the surface to be a purely technical problem.

It's an approach that simply can't be learned in a classroom, and it has expanded the role the engineer plays in our society. As Hydro's experience with acid rain indicates, you'll find that engineering these days demands talents and judgments that go well beyond basic technical expertise.

I mentioned at the outset of my talk tbat as well as having a changing role to play in society, today's engineer also has to cope with a change in public attitude toward tbe engineer. This has not been a change for the better, I am afraid. Engineers are not on tbe top of tbe public's list of favourite people. It has become fashionable lately for non-technical people to downgrade science and tecbnology.

On the surface it all seems very odd. After all, when it comes down to satisfying basic human needs, engineers have made contributions which no one can dispute—better health and life expectancy, bigher skilled jobs, and less time spent in drudgery. Add to tbis tbe luxuries and refinements like electronic entertainment systems, long-distance telephones, and world-wide travel and it's hard to see wby people should be down on engineers. So wbat's the problem?

Obviously, there's a great need for engineers to communicate witb tbe public. Engineers didn't always have to do this. In fact, in the past tbey were more likely to scorn any attempt to popularize technical subjects.

It has been said that professional engineers often delight in stifling lay curiosity under a suffocating mass of detail instead of providing that ounce of insight wbich is worth a ton of facts. As a result, in some quarters engineers are considered the worst of professional communicators. So, I say, if engineers are to create a better public image, they must take on the burden of communicating with the public.

I think there's an uneasy feeling among the public that technology is changing our lives in a fundamental way.

Perhaps one of the reasons is that technology itself is changing in a way that isolates it from most people. Machines in the home and in the office

Engineering and the Public

used to be largely mechanical designs, but advances in electronics have changed that. Now tbat the levers and spingles and cams bave been replaced by IC's and LED's and magnetic tape, people don't take machines apart anymore. And they don't try to fix them eitber. It is enough that they know how to use a machine witbout understanding how it works.

Along with the isolation of technology there is fear. Tbe public doesn't know why or where technology is leading us, and the process is happening a little too fast for comfort. Worse, the change is being effected by inaccessible bureaucrats who speak a jargon most people don't understand.

This matter of the public perception of tbe engineer is difficult to separate from our expanding role in society. We must build in a publicly acceptable way, but, more than tbat, we must talk about what we build in a way tbat creates public understanding and public acceptance. If we are to cope with public scepticism about technology, then we have to make crystal clear to tbe public and legislators alike the consequences and benefits of actions or failure to take actions. To do so with confidence, clarity, and bumility is tbe engineer's job.

It's not going to be easy. The conflicting demands the public makes on engineers are difficult in a way that the university never trained us for. In fact, they sometimes seem irreconcilable.

As engineers, we must be prepared to speak in public forums—as I am doing now—and make it known that we are not creatures out of science fiction who can't make mistakes. We do, and we should be prepared to speak about them. If we don't then the uninformed, misinformed, or those witb axes to grind will do it—and to our detriment.

People who have been bighly educated in a special discipline take deligbt in using its jargon—I know I did. But I've learned—sometimes the hard way—that speaking plainly is a lot more effective. Communication, after all, is not what you say but wbat the other person hears.

Years ago, a company could simply rely on its engineers to go ahead and come up witb the best design for any given project. Not any more. Now, we often have to test the waters of public acceptance at tbe outset—and all the way through a project. So there are more than just engineers at work on any engineering project tbat involves the public, however remotely. Today's approach is likely to involve, and require, co-operation among those from many disciplines—for example, land use planners, public attitude analysts, biologists, and community relations specialists.

"A few years ago the procedure we now follow seemed an exasperating rigmarole. Today, it is accepted as standard operating procedure."

Nowbere is the importance of non-tecbnical concerns more dramatically illustrated than in the case of transmission lines. In selecting routes, engineering ingenuity isn't usually the prime factor. I'd say it was patience and the realization tbat the technically elegant solution to a problem isn't always appropriate.

Back in 1971, Ontario Hydro designed a 500 kilovolt transmission line to run from tbe Bruce nuclear plant on Lake Huron to Milton. On the basis of some sound engineering analysis, we came up with the chosen route. But when our surveyors and property people went out along the route they were faced with angry farmers and citizens armed with pitchforks, shotguns, and manure speaders. They didn't believe the line was needed, and, in any event, were opposed to the route we wanted to take. Ater a lot of wrangling—legal and otherwise—we managed to get the line in, but it was completed four years behind schedule.

Now, 10 years later, we face a similar line project, tbis time to carry power to southwestern Ontario from the expanded Bruce plant. We knew there would be objections all along tbe 300 mile route, so what we did was draw up 6 different system plans—not specific routes, but general corridors within whicb a specific route could be developed. Each of tbese 6 plans was technically feasible, and carried its own price tag—from $670 million to $838 million. The alternatives involved a variety of social and environmental factors, so we held hearings in the areas affected, and invited the public to join in analyzing the alternatives. This took place over a four month period.

When the public discussion was completed, we submitted a preferred plan to the Ministry of the Environment so tbat public review hearings could be conducted. These are currently taking place. When tbey have been completed, a plan will be selected. But we still bave to decide on a specific route within tbat plan. There will be a second stage of public hearing prior to selecting a specific route.

In summary, it works out roughly like this: three years to get a route approved, and another three to build the line.

A few years ago the procedure we now follow seemed an exasperating rigmarole. Today, it is accepted as standard operating procedure. And whether we're talking about transmission lines or other, grander engineering endeavours, we have no choice but to accept the difficulties and challenges that a changing social climate has thrust upon us.

Public expectations and standards tbemselves have cbanged. Fifty years ago, Oliver Wendell Holmes suggested that "It's a fiction to believe that business is clothed witb public interest and devoted to public use." And another commentator complained that, "Corporations have neither bodies to be kicked nor souls to bedamned."

Today, corporations are being kicked and damned nevertheless. And before long, you'll find yourselves in the thick of the fray—working witb others to make decisions, to produce solutions and explain them to the public they are designed to serve.

Whether you work for a public or private company, you are going to find yourself part of an organization that sometimes deserves a kick in the rear end, and is sometimes damnable. It is up to you as engineers, just as much as it is up to tbe corporated brass, to see that your organization behaves itself like a responsible and sensitive individual with a body and a soul...and a beart.

Eng. Soc. News

CCES Successful

hy Gerry Gurian

From January 6 to 10 of this year, the 14th Congress of Canadian Engineering Students (CCES) was held at Waterloo, Ontario; being jointly sponsored hy the Engineering Societies "A" and "B" of U. of W. Approximately 125 student delegates, drawn from every accredited Canadian Engineering institution, attended the conference to take part in and henefit from the series of panel discussions, student paper presentations, plenary sessions and social events arranged throughout the five day meeting. The University of Toronto sent a delegation of four to this year's congress: Brett Clader, Gerry Gurian, Vince Volpe and Roh Zingel. This article has heen prepared as a summary of the 14th CCES to the Engineering Student hody.

Theme of the 1982 conference, which, incidentally, is hosted hy a different Canadian university each year, was "The Professional Engineer in Today's Society". In accordance with this theme, topics such as the operation of the Canadian Accreditation Board, the Canadian Engineering Environment (a discussion of the role of engineering unions vs. engineering associations), and the controversial matter of the funding of universities were discussed hy the following guest speakers to the coference:

Dr. Gerry Monforton,
Canadian Accreditation Board memher

Mr. C. Bailey,
Design Engineer, Reactor Control and Safety Systems, AECL

Mr. D. Mucci
Vice President and G.M. of Fleck Manufacturing Co.

Mr. G. Perron,
President, Canadian Council of Professional Engineers

Mr. B. Wilson,
Assistant to the Deputy Minister of Colleges and Universities, Ontario

Several interestilng points were hrought out in the conference. First, an important difference hetween the university funding procedures of Ontario and Quehec provincial governments was discussed. Ontario classifies university enrollment into the various professional or general faculties while the Quehec program considers university enrollment as a whole. Another idea discussed was that the professional engineer of the future would play a greater role in the managerial side of operations rather than concern himself/herself solely with technological aspects.

The 1982 CCES also featured guest speakers to address the topic of "The Engineer and Space Technology". Dr. J. MacNaughton, Dr. C. Wagner-Bartak, and Mr. J. Stewart, all of Spar Aerospace, as well as Dr. P. Low of the Ministry of State for Science and Technology, and Mr. J. Taylor, the President of Canadian Astronautics Ltd., led a fascinating discussion on Canada's role in this expanding new frontier. These gentlemen dealt specifically with the Canadian remote manipulator system for the space shuttle and the applications of satellite technolgy to resource development and search and rescue. A short film produced hy Spar Aerospace served to visually document the evolution of the shuttle manipulator arm through its many stages of construction and testing.

Six universities presented papers at this year's CCES and some of the more interesting were the University of Waterloo's "Alternatives to the Space Shuttle" and Western's discussion on the state of current technological advancement and its social consequences. There is a good

continued on page 8

Engineering Alumni Athlete

Photo by Ben Poblete

Roh Yates presenting Ian Macdougal with his award. The Award is presented hi-monthly to an Engineering Undergraduate for their high involvement and outstanding performance in intramural athletics. Nomiation forms are availahle from Ella, the Engineering Society secretary, in the Eng Soc offices.

Roh Yates is Chairman of the Engineering Alumni functions of class organization committee. In his undergraduate years, he was Eng Soc President, Bnad Leader and a Skule Niter, among other things. Roh (Elec 7T9) now works for Bell Canada.

Ian MacDougall (Chem 8T3) was selected for his contrihutions to the Sr. Engineering hockey team. In the fall, Ian also played on Skule's tackle football team. Besides this, Ian also coaches in intramural sports.

Eng Soc Elections

The Engineering Society has adopted new election procedures in preparation for the Society elections to he held March 4 and 5.

The rules, authored principally hy Society Treasurer Barry Levine are similar to the previous guidelines hut contain several clarifications. They were accepted by the Council in hopes that difficulties encountered during elections in the past couple of years could he avoided this year. Vice President:Adminlstration John Voss, who was appointed Chief Returning Officer for the elections, explains that these difficulties resulted mainly from the complexity and lack of clarity in the old rules, and inconsistencies in the way the rules were applied. "The new rules make the restrictions on election posters much clearer and much easier to apply. This has heen a hig problem in the past. Also we've made some of the rules a little more reasonahle and practical," said Voss.

The new rules provide for Deputy Returning Officers who along with the CRO will enforce the election rules and consider, as a committee, any complaints or protests received concerning the conduct of election candidates. Added Voss, "In the past, the CRO has heen the sole authority in enforcing election procedures. The new system should make the process somewhat more consistent and fairer." The Deputy Returning Officers are Rick Deighton (Civil 8T2) and Rohert Piane (Civil 8T3).

The nominations for the elected Officers of the Engineering Society for the 1982-83 term open February 1 and close February 26. Campaigns will run from March 1 to 3, with elections on March 4 and 5. It is expected that most of the positions, and perhaps all five, will be contested. Presently, the Engineering Athletic Association plans to conduct its presidential election in conjuction with the Society elections. The student referendum concerning the proposed $100 incidental fee will also he held on those days. The newly-elected Engineering Society officers will take office March 16.

As Voss says, these upcoming elections will he a practice run for the new regulations. The hope of the Council is that the rules will he amended, if necessary, and then entrenched in the Society's constitution. This is one of several constitutional amendments projected for next year's Council.

U of T Radio and Engineers

hy John P. Boudreau
Station Manager, UTR

The types and styles of hroadcast license available to a university hroadcaster are limited as much by the market one operates within as hy the actual means of signal transmission. The market in the city of Toronto is so crowded tbat only three spaces are left on the FM dial for Canadian generated radio. Fortunately, these locations have heen frozen hy the CBC while it decides on its future. It is more than a safe het that the CBC will not ahsorh all three channels into the National Radio System in view of the demise of the CBC—2 proposal. Consequently, the CRTC has effectively refused to entertain FM applications from commercial or educational interests at this point in time.

AM stereo as a means of transmission has met with limited success in California hut not without beavy capital risk. AM stereo in Canada was originally throttled hy FM stereo broadcasting, and sball in all likelihood he dealt a death hlow with tbe introduction of Pay-TV audio channels of higher frequency response transmission capahilities. Regular AM presents serious technical limitations and high capital cost as well as difficult CRTC policy restrictions on programming content. Quite simply, if one wants to establisb a university-hased broadcast facility, AM is a poor competitor to stereo transmission on either cahle networks or a full-powered FM station.

Before one can justify the amount of financing necessary for a full powered FM proposal, he must have a viable operating base. The loop-hole in CRTC policy is the AM Carrier Current Licence. Carrier Current AM is a means of transmission in which the electrical wiring in a building hecomes the antenna. Trinity Collegy and Devonshire House are wired for this transmission mode and are waiting for the 'firing up' of the UTR transmitter. Effectively all wbo reside within the building can receive the station on the AM dial. Reception quality varies from huilding to building, and it is clear that this method of reaching an audience is not why one would go through the agonies of ohtaining such a licence.

Possession of an AM Carrier Current Licence places the mantle of "Broadcaster" onto the applicant, and legally forces a local cahle carrier (Rogers Cahle in our circumstance) to carry the station on its TV/FM service. The station thus gets a means of transmission equal to full power FM Stereo in everything but total distrihution area. Currently Rogers reaches some 300,000 plus people in East York, Nortb York, and the City of Toronto. Negotiations for further coverage on other cahle networks in Metro Toronto could hoost the potential audience figures to 500,000. In addition, the Department of Communications (DOC) assigns a frequency on the FM dial to the AM Carrier Current hroadcaster so that hy simply feeding cahle service to the FM antenna screws on the hack of most stereo receivers, listeners can tune in the station.

One final means of hroadcasting has, to the hest of our knowledge, not heen brought to the attention of the DOC as an operating proposal. This concept calls for the placing of a coaxial cahle around the huilding which houses potential listeners. Using the same frequency as assigned on the Cahle-FM hand, the hroadcaster uses the coaxial cahle as an FM antenna and transmits only in the specified huilding without radiating heyond it. If any reader knows more about this means of broadcasting let me know, as this appears to he an easy cost-effective way to hroadcast to practically every huilding on the St. George Campus. However, UTR would have to negotiate with the DOC on this matter before putting it into practice.

By way of closing this portion of the article, allow me to clear the air on a few possihle points of contention in the licencing procedure. First, hecause of Federal Broadcast laws and regulations, U of T Radio must incorporate and separate from SAC. This is required in order to ensure that only Canadians can sit on the governing hoard of the station. (Please note that this is the only restriction on participation in the station. All students may he volunteers regardless of their country of origin.) Finally, students must remain in the majority on the governing board in compliance with CRTC regulations. Almost half of the governing board, which is elected for two year terms, will come from within the professional faculties, providing no more than two come from any one constituency. In short, if any engineer is interested in broadcast communications management, this is his/her golden opportunity.

The Concept of the Sound

Allow me to stress that retreads of National Radio material (CBC), strict presentation of courses and "that was, this is" music programming (CJRT), or "sell those ads with those songs" (everyone else in Toronto) will get University of Toronto Radio ahsolutely nowhere.

Interesting dispersion of information from the U of T data base, establishment of a unique, local talent arts forum (music, drama, poetry, free verse, student media), and serious analyses of major issues through public forums, featuring the minds working at U of T in ALL fields, will get the project from the drafting tahle to the radio dial.

Training in hroadcast media will prepare students for tbe changing world of the electronic media. Airing of concerns, entertainment, and university community events, will define the boundaries of student consensus at the university to the public-at-large.

Specifically, engineering students can pursue interests in fields such as acoustics, electronics, digital recording, and fiber optics. That one of you could pursue graduate research at the hroadcast facility and perhaps develop an interesting niche for yourself upon graduation is a real possihility.

Advances in research, properly presented to the puhlic may comhat tbe underfunding mentality currently sweeping the minds of policy makers who allocate funds for professional faculties. Tell them why you are doing what you are doing and you stand a hetter chance of receiving adequate funding.

Allow me to put this entire article into perspective. First of all, the licence UTR is seeking is a means of creating the infrastructure required to obtain a high power, Stereo FM educatonal hroadcast facility on the St. George Campus. The immediate cost will probably be $3.25 per undergraduate head per year. This is the most cost-effective means of effecting change as students perceive it, while coincidentally providing a non-commercial entertainment radio station for the enjoyment of the student body-at-large. This fee will be hrought to a student referendum in March. It is important that all student's realize there are no political ramifications surrounding the UTR referendum.

Finally, it is crucial for all engineering students to remove any possible bias that this is only an "artsie" project. There are more that enough opportunities for professional faculty students to manage, program, and perform academic and private study at a serious radio hroadcast facility located on the ST. George campus.

Skule's athletes playing haskethall and earning valuahle S-points.

EAA S-Dance Approaches

hy June Li
EAA Puhlicity Director

Skule has just gotten off to a start and yet the winter sports are well into their schedules. Believe it or not, some playoffs start soon after reading week.

With 24 teams in hockey, Engineering's dominance in the men's league continues. This year, we have once again managed to enter five volleyhall teams.

The women's innertuhe waterpolo team is confident that they will be ahle to repeat last year's record of winning the championships. Over half of last year's players have returned. Three teams have heen entered in each of women's squash and volleyhall. Last year, Skule won hoth Division 1 and 2 squash titles. This year, Division 3 bas heen added and we'll try to win that too.

Away from the battle grounds, a different kind of entertainment is coming soon: the S-Dance. Contrary to popular helief, this FREE night of fun is open to ALL engineers and dates, hecause all engineers are paying memhers of the Engineering Athletic Association (EAA). The S-Dance is being held at the Chelsea Inn (Bay and College), on Friday, March 12. To get in, you will need a ticket, so we'll know you aren't a ruhhy off the street. These tickets can he easily picked up at the Engineering Stores. Who would pass up a night of FREE entertainment, including a buffet and live hand? Certainly not a poor engineering a student! Engineering has a large numher of trophies, all of which will he on display. Besides this, you will get a commemorative glass with the Skule "S" on tbe side.

To those of you who have participated in intramural sports, don't forget to fill out your S-points forms hefore Ski Week. The forms and instructions are now available from Ella in the Engineering Stores. Some changes have heen made in the women's S-points system. Also, co-ed sports will receive points for participating in co-ed sports.

Recently, there have been complaints that fans who want to go and cheer on engineering teams don't know when the games are. Althougb the EAA cannot print up posters each week to advertise the games and their times, the U of T recreation office does print weekly schedules. These are posted on the first floor of the Old Metro Lihrary in front of the Engineering Lihrary. Most engineering teams have "Eng." or "Skule" as part of their names although there are some oddities such as *Team Short, Team Entropy, Burgess' Bunnies* and *Flippin' Newtons.*

In a little over a month, it will be time to appoint the new EAA executive. All memhers, except for the president, are appointed. The EAA president is elected hy the student hody. To he a commisioner for a certain sport, it is suggested that you he familiar with the sport. However, there are also the position of Secretary-Treasurer and Director of Pnhlicity. If you would like to get more involved in the EAA executive, watch for notices stating when the applications can he filed.

If you have any comments or suggestions for the EAA, write a note to the EAA President or Puhlicity Director.

Engineering Alumni Athlete

Photo by Ben Perkins

David LeGresley presenting Pam Selhy with her award. The Award is presented hi-monthly to an Engineering Undergraduate for their high involvement and outstanding performance in intramural athletics. Nomiation forms are availahle from Ella, the Engineering Society secretary, in the Eng Soc offices.

David LeGresley (Mech 8T1) is presently working at Gulf Canada's R&D centre in Toronto. He was president of the Engineering Society last year and has played waterpolo and swam for Skule. He is now a council memher of the Engineering Alumni.

Pam Selby (Ind 8T3) wins this award for participation in interfaculty sports and her second place finish last fall in the Interfaculty swim meet. Pam also plays squash, soccer, volleyhall and innertube waterpolo.

Engineering This Month

Tuesday, February 2 to Friday, February 26
Eng Soc Nominations

Nominations for the five executive officers of the Engineering Society are open. Pick up forms and further instructions from Ella in the Engineering Stores..

Wednesday, February 3
SPIF Comittee Meeting

Further discussion of the Special Proposed Incidental Fee is featured. The well known engineering celebrity and BMOC, Mike Nettleton, will chair the meeting, 5:00 at the Engineering Stores.

Centennial Committee Meeting

Adjoining the SPIF meeting, there will be a Centennial Committee meeting at 5:00 in the Engineering Society Offices. First and second year people especially welcome.

Wednesday, February 3 to Saturday, February 6
Skule Nite

Don't miss the annual engineering comedy revue. Tickets are ALL sold out so please DON'T ask Ella for them. Curtain time is 8:30, please don't be late.

Tuesday, February 9
Eng Soc Executive Meeting

Another in an infinite series of meeting. This one will again be at 5:00 p.m. in Hart House, and certain snacks may be served.

Wednesday, February 10
Women in Engineering Dinner

This year the annual Women's Dinner will be held in the Music Room of Hart House. The cash bar opens at 6:00 p.m. and dinner is at 7. Tickets are $15 available from Ella in the Engineering Stores. Wine is included with dinner.

Thursday, February 11
EngCom Layout Seminar

This short seminar starting at 5:00 p.m. in the Engineering Stores/EngCom (Communications Committee) office is the first of its kind. As part of the Communication Committee's never-ending drive for truth, justice and the Canadian way, this seminar will have veteran staffers showing the ins and outs (don't touch it) of how to put together a Skule Publication. Refresbments will be on hand. Note: this is NOT any sort of makeup, but a workshop to show interested people how EngCom does what it does.

Friday, February 12
S-Points Forms Due

To be eligible for 1981-82 engineering athletic awards, especially for participation, an S-Points form must be filled out. Ask Ella in the Engineering Stores.

Sunday, February 14
Valentines Day

Enough Said.

Monday, February 15 to Friday, February 19
Reading Week

All regualr labs, lectures and tutorials are cancelled. Please do not attend your scheduled classes this week. Honest.

Monday, February 22
CANNON **Deadline**

Deadline for all copy submitted for the March issue of *the CANNON* is at 5:00 p.m., typed preferred but this is not absolutely crucial. Please don't ask for extensions.

Wednesday, February 24
Eng Soc Full Council Meeting

This month's council meeting will be in GB 202 at 5:00 p.m. Be there or an embarassing surprise will follow. Creative refreshments promise to be the pivot point of the meeting.

Monday, March 1 to Wednesday, March 3
Election Campaigning

Those running for the 5 Eng Soc Executive positions will be campaigning. Listen to what they say so that you can make an informed decision in the elections.

ONTARIO ENGINEERING DESIGN COMPETITION

OEDC

FRI. MARCH 5th 7pm – 10pm

SAT. MARCH 6th 9am – 4pm

UNDERGRADUATE ENGINEERING STUDENTS

DESIGNING FOR THE FUTURE

UNIVERSITY COLLEGE – EAST & WEST HALLS

UNIVERSITY OF TORONTO

DISPLAYS AND SEMINARS

Students, teachers and public are welcome

ADMISSION FREE

Engineering
Shop at the **Stores**

Summer Jobs

Cominco. Third year geologic engineers in mineral processing for summer employment. Send Resume to Mr. Eyre, Recruitment and Training Manager.

CIL Explosives Limited. Second or third year chemical engineering student. Apply on or before February 12 at the CCPC.

Aqualine Products. Third or fourth year Industrial engineering student. Send resume to Miss R. Longley.

I. S. Redpath. Engineering students of any year and any discipline. Working in isolated areas with a minimum of supervision. Send resume to Mr. T.R. Masuda, Coordinator.

Strato Gelogic Engineering. Geological, geopbysics and mining engineering students. Submit resume to UNO Leis, V.P. Operations.

Xerox Canada. Second, third and fourth year engineering students. Send resume to Sabrina Ngan, Personnel. Be sure to apply before February 12, 1982.

Stax Plastics. Second, third or fourth year Mechanical or industrial engineering student. Send resume to the technical manager before March 12, 1982.

Conference

continued from page 6

chance that Western shall present its paper again at this year's Ontario Engineering Design Competition, to be held at U of T from March 5 to 6.

St. Mary's University of Nova Scotia addressed the topic of "Engineering in Nova Scotia", elaborating on the wealth of natural resources and main industries of that province. A point of concern is that the Nova Scotia engineering institutions do not provide sufficient numbers of professionals to meet with the current demand in the Atlantic regions. As a result, the province would like to attract engineering graduates from other Canadian territories.

The 'Big Event' at any CCES is the plenary session. This is a closed meeting between all delegates at which critical issues in the current Canadian engineering environment are discussed and resolutions are passed by the CCES as a body. The prime topic of discussion this year was the ETS (Ecole de Technologie Superior) situation in Quebec. As mentioned elsewhere in this issue of *the CANNON*, THE Quebec provincial government has passed a bill that demands that graduates of this technolgy college be granted full professional engineer status.

One activity crucial to the success of a conference such as the CCES can not by found on the official conference agenda. It is the socializing that takes place between the engineering students from one coast of the country to the other. The parties, late night gatherings, pool dunkings and roll tossing exhibitions served to create a light atmosphere that was present for the duration of the congress. The 15th CCES will be hosted by the University of British Columbia. They will undoubtably continue in the true CCES tradition.

The University of Toronto engineering society would like to express its sincere thanks to the Engineering Alumni Association, the sponsor of 2 delegates to the 14th congress of Canadian Engineering Students.